CLAIMS

What is claimed is:

1. A vehicular communications network comprising:

a communications channel for propagating a signal therealong;

a nodal communications system;

a signal coupling system coupled to the communications channel and to the nodal communications system for coupling a signal between the communications channel and the nodal communications system.

2. The vehicular communications network as set forth in Claim 1 further comprising:

a first impedance connected to a first end of the communications channel; and

a second impedance connected to the second end of the communications channel.

3. The vehicular communications network as set forth in Claim 2 wherein the first impedance has an impedance equal to the characteristic impedance of the communications channel.

4. The vehicular communications network as set forth in Claim 2 wherein the second impedance has an impedance equal to the characteristic impedance of the communications channel.

5. The vehicular communications network as set forth in Claim 2 wherein the first impedance comprises a transmitter.

6. The vehicular communications network as set forth in Claim 2 wherein the second impedance comprises a receiver.

7. The vehicular communications network as set forth in Claim 1 wherein the communications channel comprises a coaxial cable.

8. The vehicular communications network as set forth in Claim 1 wherein the signal coupling system comprises a field coupling device.

9. The vehicular communications network as set forth in Claim 8 wherein the field coupling device comprises:

a ground plane positioned in close proximity to the communications channel;

a microstrip line connected to the ground plane;

a dielectric base positioned between the microstrip line and the ground plane; and

a communications circuit connected to the microstrip line and the nodal communications system.

10. The vehicular communications network as set forth in Claim 9 wherein the ground plane includes a slot of prescribed width and length having an open end and a closed end.

11. The vehicular communications network as set forth in Claim 10 wherein the length of the slot is substantially equal to one fourth of the wavelength of the signal coupled between the communications channel and the nodal communications system.

12. The vehicular communications network as set forth in Claim 10 wherein the communications channel is positioned substantially near the midpoint of the length of the slot.

13. The vehicular communications network as set forth in Claim 8 further comprising an isolator for suppressing both electro-magnetic interference and unwanted propagation of signals along the outer side of the communications channel.

14. The vehicular communications network as set forth in Claim 13 wherein the isolator comprises at least one ferrite bead.

15. The vehicular communications network as set forth in Claim 1 wherein the communications channel comprises a bus topology.

16. The vehicular communications network as set forth in Claim 1 wherein the communications channel comprises a ring topology.

17. The vehicular communications network as set forth in Claim 1 wherein the communications channel comprises a star topology.

18. A signal coupling system comprising a field coupling device positioned in close proximity to a communications channel for coupling a signal between the communications channel and a nodal communications system.

19. The signal coupling system as set forth in Claim 18 wherein the field coupling device comprises:

a ground plane positioned in close proximity to the communications channel;

a microstrip line connected to the ground plane;

a dielectric base positioned between the microstrip line and the ground plane; and

a communications circuit connected to the microstrip line and the nodal communications system.

20. The signal coupling system as set forth in Claim 19 wherein the ground plane includes a slot of prescribed width and length.

21. The signal coupling system as set forth in Claim 20 wherein the length of the slot is equal to one fourth of the wavelength of the signal.

22. The signal coupling system as set forth in Claim 20 wherein the communications channel is positioned substantially near the midpoint of the length of the slot.

23. The signal coupling system as set forth in Claim 19 further comprising an isolator for suppressing both electro-magnetic interference and unwanted propagation of signals along the outer side of the communications channel.

24. The signal coupling system as set forth in Claim 23 wherein the isolator comprises at least one ferrite bead.

25. A method of coupling a signal between a communications channel and a nodal communications system of a communications network comprising:

placing a first communication network of the plurality of communication networks in close physical proximity to at least one other communication network of the plurality of communication networks;

wherein the first communication network propagates the signal therealong;

propagating the signal in the first communication network at a prescribed frequency; and

field coupling the signal out of the first communication network into the at least one other communication network for propagation therealong.

26. The vehicular communications network as set forth in Claim 8 further comprising an enclosure encompassing the communications channel and the field coupling device for confining the communications channel near the midpoint of the length of the slot.

27. The signal coupling system as set forth in Claim 19 further comprising an enclosure encompassing the communications channel and the field coupling device for confining the communications channel near the midpoint of the length of the slot.

28. The vehicular communications network as set forth in Claim 1 wherein the communications channel comprises a mesh topology.

29. The vehicular communications network as set forth in Claim 10 wherein the microstrip line is positioned across the slot at approximately 90 degrees for maximum field coupling between the slot and the microstrip line.

30. The vehicular communications network as set forth in Claim 10 wherein the microstrip line is positioned near the open end of the slot.

31. A vehicular communications network comprising:

a communications channel for propagating a signal therealong;

a nodal communications system;

a field coupling device for coupling the signal between the communications channel and the nodal communications system;

wherein the field coupling device comprises a ground plane positioned in close proximity to the communications channel;

a microstrip line connected to the ground plane;

a dielectric base positioned between the microstrip line and the ground plane; and

a communications circuit connected to the microstrip line and the nodal communications system.

32. The vehicular communications network as set forth in Claim 31 wherein the ground plane includes a slot of prescribed width and length having an open end and a closed end.

33. The vehicular communications network as set forth in Claim 32 wherein the length of the slot is substantially equal to one fourth of the wavelength of the signal coupled between the communications channel and the nodal communications system.

34. The vehicular communications network as set forth in Claim 32 wherein the communications channel is positioned substantially near the midpoint of the length of the slot.

35. The vehicular communications network as set forth in Claim 31 further comprising an isolator for suppressing both electro-magnetic interference and unwanted propagation of signals along the outer side of the communications channel.

36. The vehicular communications network as set forth in Claim 35 wherein the isolator comprises at least one ferrite bead.

37. The vehicular communications network as set forth in Claim 31 wherein the communications channel comprises a bus topology.

38. The vehicular communications network as set forth in Claim 31 wherein the communications channel comprises a ring topology.

39. The vehicular communications network as set forth in Claim 31 wherein the communications channel comprises a star topology.

40. A field coupling device for coupling a signal between a communications channel and a nodal communications system, the field coupling device comprising:

a ground plane positioned in close proximity to the communications channel;

a microstrip line connected to the ground plane;

a dielectric base positioned between the microstrip line and the ground plane; and

a communications circuit connected to the microstrip line and the nodal communications system.

41. The field coupling device as set forth in Claim 40 wherein the ground plane includes a slot of prescribed width and length.

42. The field coupling device as set forth in Claim 41 wherein the length of the slot is equal to one fourth of the wavelength of the signal.

43. The signal coupling system as set forth in Claim 41 wherein the communications channel is positioned substantially near the midpoint of the length of the slot.

44. The signal coupling system as set forth in Claim 40 further comprising an isolator for suppressing both electro-magnetic interference and unwanted propagation of signals along the outer side of the communications channel.

45. The signal coupling system as set forth in Claim 44 wherein the isolator comprises at least one ferrite bead.

46. The vehicular communications network as set forth in Claim 31 further comprising an enclosure encompassing the communications channel and the field coupling device for confining the communications channel near the midpoint of the length of the slot.

47. The signal coupling system as set forth in Claim 40 further comprising an enclosure encompassing the communications channel and the field coupling device for confining the communications channel near the midpoint of the length of the slot.

48. The vehicular communications network as set forth in Claim 31 wherein the communications channel comprises a mesh topology.

49. The vehicular communications network as set forth in Claim 32 wherein the microstrip line is positioned across the slot at approximately 90 degrees for maximum field coupling between the slot and the microstrip line.

50. The vehicular communications network as set forth in Claim 32 wherein the microstrip line is positioned near the open end of the slot.

51. A method of field coupling a signal between a communications channel and a nodal communications system of a communications network, the method comprising:

positioning a ground plane, having a slot of prescribed width and length, in close proximity to the communications channel, the communications channel substantially near the midpoint of the length of the slot and substantially perpendicular thereto;

connecting a microstrip line to the ground plane;

positioning a dielectric base between the microstrip line and the ground plane;

exciting fields encircling the communications channel orthogonal to the axis of the communications channel exciting thereby fields encircling the microstrip line;

coupling the fields encircling the communications channel with the fields encircling the microstrip line;

connecting a communications circuit to the microstrip line and the nodal communications system; and

propagating a signal, indicative of the coupled fields, along the communications circuit to the nodal communications system.